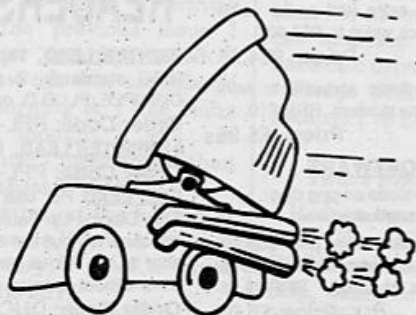


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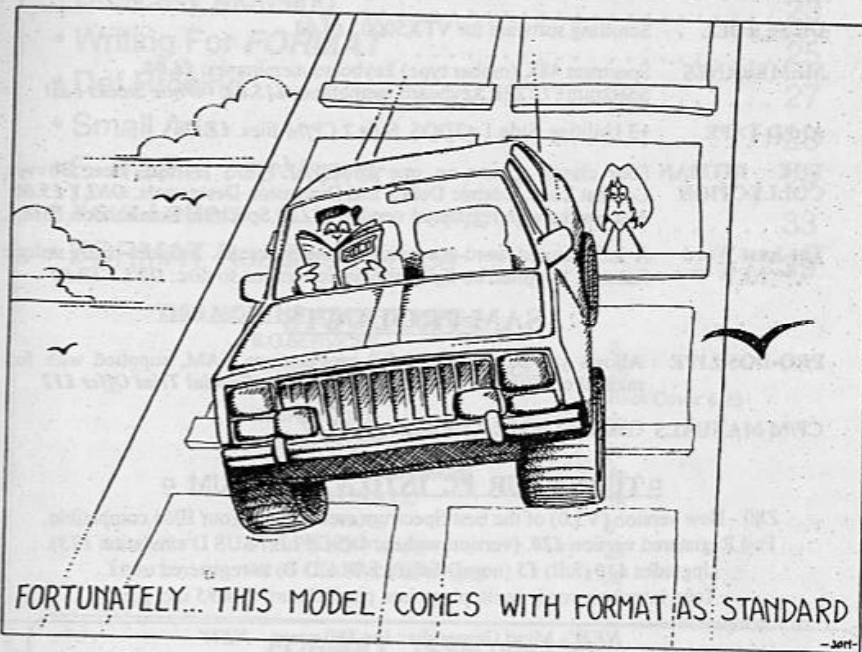
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Vol.8 Nº8.

April 1995.

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NEWS ON 4

CONSOLES

It looks like the console giants, Sega and Nintendo, are going to have a rough time over the next few months following the Monopolies and Mergers Commission report on their pricing and restrictive practices.

Although the report itself makes no firm recommendations it does conclude that both companies have acted against the interest of third-party software providers and, more importantly, against the interests of the consumer. One of the biggest complaints made related to overpricing, and while the report did not recommend a price cut it did point out several areas in which the companies were deliberately seeking to keep prices higher than a free market would normally allow.

SAM CHESS

"It could be just around the corner..." says Colin McDonald, head of FRED Publishing. "I would expect the first dedicated SAM chess program to be hot-on-the-heels of the launch of our new 'C' compiler."

It seems that most of the code written for chess type programs these days is written in 'C', so it will be easy to port a copy of the main chess routines from IBM PC type machines once the compiler is finished. With a launch of 'C' due at the April show here in Gloucester, keen chess players may not have to struggle with emulated Spectrum programs for much longer.

HIGH STREET MAGS - SALES DOWN

The ABC figures for nearly all of the computer mags available on the

newsagents shelves have taken a big tumble in the second half of 1994. (ABCs are the figures produced by the Audit Bureau of Circulations, they relate to actual issues sold rather than the print-run figures produced by the publishers.)

The hardest hit titles were those relating to console machines but surprisingly even the PC type mags took quite a hammering. Amiga mags continued to fall but not nearly as much as had been expected.

Experts are suggesting that it is the sheer volume of titles available on the shelves that are putting many potential buyers off, so there could be a number of title mergers going on over the next six months.

£5 MILLION BID

At long last, nearly a year after Commodore International went into receivership, the end could be in sight.

German based Escom (a major computer retailing company in Germany) has placed a firm bid worth £5 million for all the rights and assets of the failed company. If no one else can beat the offer then the Amiga could have new owners by early May.

Only Commodore UK's management team and a company called Creative Equipment International have definitely entered this final stage of the race, although there could be a couple of other companies which may join in now that real figures are on the table.

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The Editor Speaks

I'm sorry to say that I have to start off this month's editorial with some very sad news. Just as I was preparing last month's issue to go off to the printer I received a phone call from John Wase to inform me that his much loved wife, Cynthia, had been killed that morning in a road accident. Needless to say everyone was very shocked at the news. While I had only met Cynthia on a small number of occasions, she was often the person I spoke to first when I was trying to chase John over the phone for his latest Short Spot, I therefore felt that I knew her fairly well. John and Cynthia had been married I believe for over 30 years, so you can imagine how shattering the loss is to John. Cynthia, who I understand was due to retire later this year, was a school teacher in Birmingham and had been with the same school for most of her teaching life. She was on her way to school on the first day after half-term (leaving John in bed with chronic back pain) when her car inexplicably collided with an oncoming van. Slowly, and with a lot of help from his many friends, John is beginning to recover and I know you will all join me in extending our sincere condolences and our best wishes for him personally.

And now, I'm sure, you want me to move on to brighter things. Saturday April 29th is fast approaching, that is of course the date of the 4th Gloucester show. A map and travel details are enclosed with this month's issue and I look forward to seeing everybody there. For those of you who have never been to a Gloucester show before, don't miss this one. There will be lots of stands, demos, people to meet and things to do. There

will also be very reasonably priced refreshments (no exorbitantly priced teas at our shows) and Gloucester is a nice place to visit anyway - so make sure you come, and bring the family.

I've had a few phone calls about the changes in the way we are now handling the mail order for West Coast Computers. It appears I did not explain myself well enough last month. So here goes for a second time...

Format Publications is now the sole mail-order agent for WCC, although we in turn supply a few other people like Fred Publishing. We will handle the UK and overseas mail-order as well as small dealer orders.

In addition, for the time being at least, I am personally co-ordinating the assembly side for both computers and interfaces, a job which had been done by Blue Alpha until Mark's illness. I've taken on this extra role because it makes it easier for me to keep customers happy as there are now fewer people between me and the actual person who solders the bits together. This makes for a speedier and more flexible service as well as saving on costs.

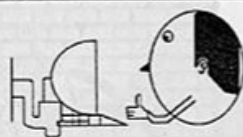
I hope that clears up any queries you may have. The whole idea is to get a better service for our customers.

Oh yes, before I go, remember that I want to hear from anyone out there who is into hardware - especially from the design viewpoint. There are some ideas, for both SAM and Spectrum hardware, that I would really like to see some work done on. Give me a ring one evening and we will talk about it.

Until next month.

Bob Brenchley, Editor.

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*Requires MasterDos and MasterBasic to use OPUS single density discs.

Spectrum Owners

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* Using SpecMaker Spectrum emulator

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DISCOVERY HISTORY

or How The Wase Was Won

By:- John Wase.

This is a short (well sort of) and rather personal history of the way that I got involved in the Discovery Disc System. It all started when I converted my rubber-keyed beer mat into a word processor (at the time, word processors came as a dedicated package at several thousand quid), and started using it to produce the typescript of papers for publication in Scientific Journals. Does betagalactosidase turn you on? Well, there it is, filed away on a cassette. I bought clear acrylic boxes holding five coloured cassettes: they are there in front of me as I type, each with the contents on a little piece of card inside the box. For I need that information. Even now, I need to go back to some of those texts.

So I remember well the first Microdrives that I saw. Reviewed around Christmas 1983, but I didn't actually see one until much later on. And the articles by Andrew Pennell in *Your Spectrum* on using them. And the comments which went round about reliability. I couldn't afford to have ASCII I couldn't recover. So I went on using cassettes, but looked out for a reliable disc drive system.

I kept on looking. By early summer, 1984, the Viscount and the FDI systems had both been announced. Both operated 5 1/4" floppies with - wait for it - 100k of storage. Wow! Puts the Microdrive's 90 or so kilobytes into perspective, doesn't it. Their operating systems were incredibly clumsy, and, even more

seriously, they pinched some space out of RAM for the operating system - up to 8k just below RAMTOP. Hardly congenial for using with programs like Tasword 2. I held my fire.

As you know, the Microdrive operated on the basis of a shadow ROM in Interface 1. An error paged this in, so that it was possible to check if the command was one which the shadow ROM understood. If it was, it was acted on before control, in either case, was restored to the main Spectrum by paging its ROM back in. Typically Sinclair, typically devious. But, as you can see, essentially no RAM was, in theory, necessary to run it. In practice, the streams and channels area is necessary, located below Basic. This area is actually expanded if you load a program from Microdrive, pushing Basic up a little. Code above RAMTOP is, of course, unaffected. Viva Tasword.

By August 1984, Opus was advertising in *Sinclair User*. They were offering a 1 megabyte drive and interface for £319.90 much better value than the £245 or so for the Viscount or FDI. Wase began to take notice. "Reduced amount of RAM taken by interface. Uses Microdrive syntax" intoned the full-page adverts. The advert in my September issue of *SU* is scribbled all over - clearly enquiry time. Evidently my enquiries indicated that it worked in almost exactly the way the Microdrive did. Smart. I guess I ordered about then. I've a little note,

pencilled on the ad, saying "More than 3 weeks..."

More scribbles on the October full-page. The big box finally arrived on December 20th - with a BBC utility disc and instruction manual. As you couldn't format a new disc without the utility disc, I was lumbered with so much useless technology. In the fullness of time (24th December!) I got the correct instruction book.... And shortly after Christmas, an instruction book with all the pages printed (the Wase gremlins never sleep).

The SpectraDOS interface came in an incredibly heavy black wedge-shaped stove-enamelled sheet-metal box, intended to fit under the Spectrum like Interface 1. It worked in the same way, too: error messages were intercepted and the shadow ROM was paged in. Unlike the Microdrive, though, it didn't need to take any RAM in the channels area when a program was loaded. Effectively, what you had was an improved Microdrive system, driven by a slightly improved shadow ROM, but which worked a disc drive rather than a Microdrive. Except that mine refused to work properly. Talk about frustration...

By that time, I was so fed up that I shot the lot in the car and hot-footed it down to their research base in Bristol. True enough, their technical guru, Ian Hirst, had to admit it didn't work. This was the unlikely start of a friendship: I acknowledge with gratitude the help Ian has given me on a number of occasions. Like the time he got a new ROM for the SpectraDOS... But back to the problem.

This appeared to be lack of power. The sheet-metal wedge concealed some state of the art chippiness. And state of the art chippiness was pretty power-hungry chippiness in 1984. If you were lucky, it

worked. If you weren't, it didn't. I wasn't. Clearly my Speccy was one of the low power jobs...

Ian promised they would look into it. I persevered. Actually, I liked very much the format program (shades of the BEEB) which flashed each track in green as it was being formatted. And the new ROM? Well, I remember being driven round to a quarter of Bristol best described as "faded elegance". You know; those tall late Georgian or early Victorian houses, with delicate cast iron balconies, rusting gently over the once-white plaster and stucco fronts of green-streaked, formerly gracious dwellings. Weeds in the spouting; cars and dustbins in the front garden, and a row of bells for the flats of the poor divided mansion. Ian hushed me to silence and applied himself to the bell. Eventually, long after I would have given up, a tousled head appeared through the window, three floors up. Although it was about four in the afternoon, Dave Corney, who had made such a good job of the ROM, was still abed - he'd spent all night programming and fallen into bed soon after dawn broke! A swish, and the key fell among the weeds. Ian disappeared into the house. After what seemed like an age, there was a whistle from aloft, and a freshly programmed EPROM came sailing down from heaven. I caught it before it disappeared into the groundsel. Version 1.21 had arrived.

Trouble is, new ROM or no, SpectraDOS was, for me, unreliable. It really didn't. And often wouldn't. They aren't all, though. I regularly meet a gentleman at the All-Formats Fair with one still going strong. Anyway, the upshot of this was that I had one of the first Discoveries.

In retrospect, I guess Opus produced

the short run of SpectraDOS interfaces to show the system worked. For they then had an agreement with Boots, who were to have sole marketing of the new gadget; the Discovery. Boots were, at the time, setting up computer sections in their high street shops.

However, shenanigans set in. Opus claimed that their Discovery was fine. The power supply got very hot, but that was O.K. Boots, I am sure, would have made counter-claims, some of the modifications demanded at the time were interesting. I don't know who was demanding them, or his technical competence, so I will say no more. The result was that whilst Discoveries were selling well on the Continent, where they appeared to offer no hazard (though, in fairness, operating at 220 volts instead of 240), I had to wait. So did Opus.

The New Year dawned with full-page adverts in *SU* and on the rear cover of *YS*. "The Dawn of a New Beginning for your Spectrum... The very latest 3.5" disc drive unit... On-board power supply. But the biggest discovery of all is the price - just £199.95".

However, it was the May issue of *YS* which first produced a glimmer that we might at last see something. Their *Frontlines* feature contained a little pic of a Spectrum+, linked onto one of these black boxes. The caption read "...Our first review copy glowed like a furnace..." Maybe Boots were right... Incidentally, the May *Frontlines* also featured the *Gordon Microframe* from Gordon Micro Ltd., a new company from Ayr. I wonder who was at the back of that one?

However, the June issue merely contained a competition - "Win one of five new Discovery disc drives". It was left to the July issue to run a rather colourless review, alongside the Triton

Quickdisk. It was clearly also intended to include the Crescent, but they couldn't produce hardware in time, and Watford were also taking full page adverts for their interface. Clearly the Boots' delay had allowed the competition to stiffen.

The computer boom had also clearly gone over the top. By August, reports were appearing of Robert Maxwell bailing out Clive Sinclair. However, I was past caring by then. I had my Discovery.

This was one of the early ones. I still use it; indeed, I am typing to a disc in the unit today. It has a 2.2 ROM in it now: the lid is off and the ROM is labelled. The SpectraDOS used ROM series 1.x, the Discoveries 2.x. This one arrived first with a 2.0 or a 2.1 ROM: I can't remember. I guess it was a 2.1, for I don't remember a 2.0. The operating system was similar in many respects to the SpectraDOS, though all the utilities like *FORMAT* were now in ROM. The sheet steel box was a very tight fit over the pcb, later issues had more room. But it still works fine.

The operating system is in many ways unlike that of the PLUS D. It swans along much more slowly, though it uses the same controller chip. But there's no boot disc, no messing about. That's really why I like it so much. The original Discovery came with a 40 track single sided drive, but you can put any drive you like to it. This one has the original 40 track single sided 3½" drive alongside a 5¼" double sided 80 track drive. And it knows which one it's got, and how to format them. All without a boot disc. How does it do this? By a neat trick of the operating system (which is, both sophisticated and crude).

The operating system is crude in the way it writes discs. The first file's the

Directory. Anything else is written into contiguous sectors as a series of contiguous blocks of code, starting at the beginning of the largest free space on the disc. A lot of erasures and you've a lot of little bits of unusable free space, so you have to use a special function to compact the disc. This simplicity gives one advantages, too. For instance, in the case of errors, your code is much easier to recover, as it's on adjoining sectors, unlike the bit-mapped approach of the PLUS D or SAM, where it could be anywhere.

Open up the case. Alongside the ROM is a socket. Stick an IC6116 chip into this. Fine; now you've got a bit of shadow RAM on board. When you power up, the important bits of the ROM are copied into RAM. Now plug in Drive 2. There's a socket on the board - takes the standard BBC connector. The other end's in a double sided, self-powered 5¼" drive. Stick a blank disc in and try to format it. The thing will try to do a 40 track format on one side. Yes, I know I said it would recognise an 80 track double sided drive. Take a formatted 5¼" 80 track double sided disc, preferably with something on it. Do a "CAT 2". Fine. Read it. All O.K. Take the new disc. Reformat it. 80 track, double sided, no problem because when you did the CAT 2 the directory was read. About the first thing in this is the type of format. This information is used to update the defaults which were transferred to RAM on power up. And there you are. Provided you carry out some operation on a formatted disc, the unit then assumes that the drive is of that format until you tell it otherwise. I like that bit. About the only things it doesn't alter are the times it takes to move from track to track or raise and lower the read/write head. The defaults

for this are pretty slow. There was, however, one batch of drives that were even slower. Provided that you've got the 6116 chip, even this can be configured if you have the appropriate rather obscure bit of Basic. But then you've got to run it rather like the boot disc.

So, we got to the stage where Discoveries were selling. Fairly well, but could have been better - don't forget that the whole home computer market was slowing down. A troubled Sinclair eventually made progress through Investronica, the Spanish Company who made the 128k Spectrum with its clumsy paging. This was the beast which finally made its way home across the water, but without keypad. Panic, panic, Discovery ROM 2.2.

PRINT USR 8 gives you the Discovery shadow ROM version number: if you've got 2.1, it'll only work on a 48k Speccy. Version 2.2, of course, contains the undocumented error report "Don't be a wally", which everyone knows.

Finally, ROM 2.22 included a glacial stepping rate to cover the batch of drives that Opus bought, along with the elderly ones that enthusiasts insisted on buying from the Microfairs.

One of the last *Personal Computer World* exhibitions was held at Olympia. Amigas were shown for the first time; so was the Archimedes if I remember rightly. And the Amstrad-Sinclair Spectrum, the grey +2 with the integral data-recorder. I remember Ian Hirst tearing round with a Discovery to check that it still worked (it did!). But by then the damage had been done. The home computer collapse, Sinclair's decline and the original Boots' prevarication had all taken their toll. Clearly, the directors of Opus had arrived at a major policy decision - abandon Discovery, liquidate

stocks, take the cash and go cloning PC compatibles. And this is what they did. Prices of Discovery disc drive units fell. And fell. Soon Boots closed their computer sales areas, disposing of remaining units as cheaply as £60.00. The Discovery was about to die.

Trouble is, it refused. Aided and abetted by various amateur clubs, it's still alive now. Of course, the clubs were there almost from the start. For instance the advert suggesting that it was "Compatible with Microdrive syntax" was true - as far as it went. Basic commands were. Machine code was most definitely not, as a comparison of tables of hook codes of Microdrives with those of the Discovery clearly shows. Club expertise was therefore vital in assisting transfer of programs - until the advent of Interface III, Romantic Robot's Multiface and other similar RAM copiers. So the clubs prospered, first in Holland, where they had a head and shoulders start. Later in the U.K. In spite of the hook code problems, there are few programs which won't work with Discovery. Tasword 2 is easily modified - you just use the Microdrive version (its tortuous commands can be shortened for the Discovery). The same goes for any other program where the loads and saves are in Basic. Other programs like Tasword +2, Masterfile or multiloading games are perhaps more of a problem; nevertheless, there are versions of most of them available. So what happens to the clubs now? Well, the principal one, based in Holland, rose rapidly and died equally rapidly. On the other hand, the main British one started more slowly and only gained momentum when Opus lost interest in their product, since their role is chiefly supportive. They produce a bi-monthly disc magazine and have a

library of software which has been transferred to disc - available to members who can prove they have the originals. I mention the British Club specifically, because they have to some extent continued the Discovery story. Tried to buy a 40 track single sided disc drive recently? You might just be lucky, but there aren't many left; they're mostly 720k DSDD jobs. So what do you do when your 40 track drive dies? After all, Opus bought several batches which were not all that good. They're mostly on the way out, now.

Discovery Club to the rescue. For ten quid, they'll sell you a new ROM which still recognises a 40 track disc, but instructs the drive motor of your new 80 track drive to double-step to accommodate it. It'll even format 40 track discs if you want it to, and there are a lot of other new commands, too.

This is the end, then, of my rather personal account of the Discovery. I have a soft spot for it as a device. It's trouble-free, pretty bug free and accurate. It had a lot of functions like expandible files (using the EXP function to add further items), and random access files, now taken up and given a new lease of life by Andy Wright in his MasterDOS for SAM. Sadly, a lot of the components on the pcbs have now reached the end of their useful lives, and are packing up. They're no longer made, either. So if you do have one; even a broken one which you're not using, do contact the Discovery Club. There are people out there in trouble and known to the Club, and it will be glad to take them off your hands.

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TABCALC

Part 2.

By:- Ted Cartwright.

Right, if you typed in all the lines I gave you last month, then all you need to do now is get on and type this months quota in.

```

3230 IF LEN T$ > WIDTH AND M=1 AND
      D N=1 AND R=1 THEN LPRINT ;
      T$(1 TO WIDTH)
3235 IF LEN T$ < WIDTH AND M=1 AND
      N=1 AND R=1 THEN LPRINT ;T
      $
3240 IF R=1 THEN LPRINT ;S$(1 TO
      WIDTH)
3250 LPRINT ;A$(M,N,1 TO WIDTH)
3260 IF R=1 THEN LPRINT ;R$(1 TO
      WIDTH)
3270 IF ((M-1)*20)+N=W THEN GOTO
      3290
3280 NEXT N: NEXT M
3290 LET R=0
3310 RETURN
3330 INPUT ; INVERSE 1;"NUMBER O
      F CHARACTER SPACES FOR MAR
      GIN
      ";Z
3350 POKE @9,Z
3370 RETURN
3380 PRINT AT 10,0; INVERSE 1;"N
      UMBER PIXELS FOR LINE SPACI
      NG ENTER:18 =1/4 inch:12 =
      1/6 inch: 7 =SUBSCRIPT
      ": INPUT Z
3390 LET Z=Z*3
3400 LPRINT CHR$ 27;CHR$ 27;CHR$
      27;CHR$ 51;CHR$ 27;CHR$ Z
3420 CLS : RETURN
4000 REM TOTALS
4010 CLS : IF COLT=0 AND LINT=0
      THEN PRINT ; FLASH 1; AT 10
      ,0;"TOTALS CALCULATION NOT
      AVAILABLE": PAUSE 200: RETU
      RN
4020 IF COLT=0 THEN RETURN
4030 GOSUB 4080
4040 IF LINT=0 THEN RETURN
4050 BEEP .1,.1
4060 GOSUB 4210
4070 RETURN

```

```

4080 REM COLUMN
4090 FOR N=9 TO (WIDTH-8) STEP 8
      : LET A$(PAGES,W-20*(PAGES-
      1),N TO N+6)="      0": NEX
      T N
4100 FOR O=9 TO WIDTH-8 STEP 8:
      LET TOT=0: LET SUBTOT=0: LE
      T COUNT=0
4110 PRINT ; INVERSE 1; AT 10,5;
      "CALCULATING COLUMN : ";INT
      (O/8);" "
4120 FOR M=1 TO PAGES
4130 FOR N=1 TO 20
4140 LET COUNT=COUNT+1: IF COUNT
      >W-1 THEN GOTO 4190
4150 IF A$(M,N,O TO O+6)=" "
      " THEN GOTO 4170
4155 IF A$(M,N,O)="T" THEN LET S
      UBTOT=TOT-SUBTOT: LET E$=ST
      R$ SUBTOT: GOSUB 8500: LET
      A$(M,N,O TO O+6)=E$: LET SU
      BTOT=TOT: GOTO 4170
4160 LET TOT=VAL A$(PAGES,W-20*(
      PAGES-1),O TO O+6)+VAL A$(M
      ,N,O TO O+6): GOSUB 8030: L
      ET A$(PAGES,W-20*(PAGES-1),
      O TO O+6)=Y$: IF COR=1 THEN
      LET COR=0: LET A$(PAGES,W-
      20*(PAGES-1),O TO O+6)="TOO
      BIG": NEXT O
4170 NEXT N
4180 NEXT M
4190 NEXT O
4200 RETURN
4210 REM LINES
4220 LET COUNT=0
4230 FOR M=1 TO PAGES
4240 FOR N=1 TO 20
4250 IF A$(M,N,1 TO 7)=" "
      THEN LET A$(M,N,O TO O+6)=
      "      ": GOTO 4320
4260 PRINT ; INVERSE 1; AT 10,5;
      "CALCULATING LINE : ";N+(
      20*(M-1));" "
4270 LET A$(M,N,WIDTH-7 TO WIDTH
      -1)="      0"
4280 FOR O=9 TO (WIDTH-15) STEP
      8
4290 IF A$(M,N,O TO O+6)="

```

```

" THEN GOTO 4310
4300 LET TOT=VAL A$(M,N,(WIDTH-7
) TO (WIDTH-1))+VAL A$(M,N,
O TO O+6): GOSUB 8030: LET
A$(M,N,WIDTH-7 TO WIDTH-1)=
Y$: IF COR=1 THEN LET COR=0
: LET A$(M,N,WIDTH-7 TO WID
TH-1)="TOO BIG": NEXT O
4310 NEXT O
4320 NEXT N
4330 NEXT M
4340 BEEP .5,.5
4350 RETURN
4360 REM KEYBOARD CLICK
4370 BEEP .007,3: RETURN
5000 CLS : PRINT "SAVE / LOAD OP
TIONS": PRINT AT 2,0;"(1) S
AVE PROGRAM TO DISC "; AT 4
,0;"(2) SAVE DATA TO DISC"
5010 PRINT AT 6,0;"(3) LOAD DATA
FROM DISC"
5020 PRINT AT 10,0;"SELECT NUMBE
R OF OPTION REQUIRED": PAUS
E 0
5050 IF INKEY$="2" THEN GOSUB 52
00: INPUT "NAME ? ";Q$: SAV
E D1,Q$ DATA A$(): RETURN
5080 IF INKEY$="3" THEN CLS : DI
R 11: INPUT "NAME ?";Q$: PR
INT AT 20,10;"INSERT THE DI
SC": LOAD D1,Q$ DATA A$():
GOSUB 5300: RETURN
5110 IF INKEY$="1" THEN INPUT "N
AME ? ";Q$: SAVE D1,Q$ LINE
500: RETURN
5120 GOTO 5000
5170 RETURN
5200 CLS : PRINT #0; AT 0,0;"SAV
ING ";Q$: LET A$(6,2)=STR$
WIDTH: LET A$(6,3)=STR$ LIN
ES: LET A$(6,4)=STR$ W: LET
A$(6,5)=STR$ VAST: LET A$(
6,6)=STR$ PAGES: LET A$(6,7
)=STR$ COLT: LET A$(6,8)=ST
R$ LINT: LET A$(6,9)=STR$ C
OR: RETURN
5300 LET WIDTH=VAL A$(6,2): LET
LINES=VAL A$(6,3): LET W=VA
L A$(6,4): LET VAST=VAL A$(
6,5): LET PAGES=VAL A$(6,6)
: LET COLT=VAL A$(6,7): LET
LINT=VAL A$(6,8): LET COR=
VAL A$(6,9): GOSUB 9350: RE
TURN
6000 REM CANCEL/REINSTATE TOTALS
6010 CLS
6020 PRINT AT 1,0;"(1) CANCEL L
INE TOTALS"
6030 PRINT AT 5,0;"(2) RE-INSTA

```

```

TE LINE TOTALS"
6040 PRINT AT 10,0;"(3) CANCEL
COLUMN TOTALS"
6050 PRINT AT 15,0;"(4) RE-INST
ATE COLUMN TOTALS"
6060 PRINT AT 20,0;"(5) RETURN
TO MAIN MENU"
6070 PRINT #0; AT 1,0; INVERSE 1
;"SELECT APPROPRIATE NUMBER
": PAUSE 0
6080 IF INKEY$="1" AND LINT=1 TH
EN LET LINT=0: LET WIDTH=WI
DTH-8
6090 IF INKEY$="2" AND LINT=0 TH
EN LET LINT=1: LET WIDTH=WI
DTH+8
6100 IF INKEY$="3" AND COLT=1 TH
EN LET COLT=0: LET W=W-1
6110 IF INKEY$="4" AND COLT=0 TH
EN LET COLT=1: LET W=W+1
6120 IF INKEY$="5" THEN RETURN
6130 GOTO 6000
6140 REM CLEAR NUMERIC DATA
6150 FOR M=1 TO PAGES
6160 FOR N=1 TO LINES
6170 LET A$(M,N,9 TO )=""
6180 NEXT N: NEXT M
6190 GOSUB 9320
6200 RETURN
7000 REM CURSOR LEFT
7010 IF C<9 AND C>0 THEN RETURN
7020 IF Y<8 THEN GOSUB 2320
7030 RETURN
7040 REM CURSOR UP
7050 IF L<1 AND L>-1 AND P=1 THE
N RETURN
7060 IF X<1 THEN LET P=P-1: GOSU
B 2380
7070 RETURN
8000 REM ATTRIBUTES
8010 CLS : INPUT "BRIGHT?";BRI:
INPUT "PAPER COLOUR?";PAP;
;"INK COLOUR?";INK: BRIGH
T BRI: PAPER PAP: BORDER PA
P: INK INK: CLS
8020 RETURN
8030 REM TOTALS-JUSTIFICATION &
CORRECTION FOR TOO MANY DIG
ITS!
8040 IF LEN STR$ TOT>7 THEN BEEP
.5,.5: LET COR=1: RETURN
8050 LET Y$=STR$ TOT
8060 IF LEN Y$<7 THEN LET Y$=" "
+Y$: GOTO 8060
8070 RETURN
8500 REM SUBTOTAL JUSTIFICATION
8510 IF LEN E$<7 THEN LET E$=" "
+E$: GOTO 8510
8590 RETURN

```

```

9000 REM FORMAT
9010 CLS : PRINT FLASH 1; AT 10,
5;"ARE YOU CERTAIN ? (Y/N)"
: PAUSE 0: IF INKEY$="N" TH
EN RETURN
9020 CLS : PRINT ; INVERSE 1; AT
8,0;"ENTER THE NUMBER OF
8 CHARACTERWIDE COLUMNS YOU
REQUIRE. DO NOT INCLUDE TOT
ALS OR TITLES COLUMNS
MAXIMUM 15 "
: INPUT WIDTH
9030 LET WIDTH=(WIDTH+2)*8: IF W
IDTH>136 THEN CLS : PRINT ;
INVERSE 1; AT 10,10;"TOO M
ANY COLUMNS!": PAUSE 150: C
LS : GOTO 9020
9040 IF WIDTH>80 THEN CLS : PRIN
T ; INVERSE 1; AT 10,10;"YO
U MUST SELECT CONDENSED
PRINTING IN THE PRINTER
ROUTINE ": PAUSE 100
9050 LET COR=0: LET LINT=1: LET
COLT=1: LET CO=0: LET W=99:
LET PAGES=INT (W/20)+1: LE
T VAST=6: LET LINES=20
9060 DIM A$(6,20,WIDTH)
9070 CLS
9080 LET A=INT (WIDTH/8)-2: PRIN
T AT 5,5;"ENTER THE NAMES O
F:-";"; TAB 5;"UP TO ";A;"
COLUMN TITLES"
9090 PRINT AT 10,3;"EACH TITLE I
S LIMITED TO A ";";: PRINT
; TAB 3;"MAXIMUM OF 7 CH
ARACTERS!"
9100 PRINT AT 15,0;"INPUT S WHEN
YOU HAVE ENTERED ALL THE
COLUMN TITLES REQUIRED. "
9110 PRINT AT 20,0;"PRESS ENTER
FOR A BLANK TITLE "
9120 FOR N=9 TO WIDTH-8 STEP 8:
PRINT ; INVERSE 1; AT 0,0;"
ENTRY ";INT (N-1)/8
9130 GOSUB 9460
9140 IF Z$="S" OR Z$="s" THEN LE
T WIDTH=N+7: GOTO 9170
9150 LET A$(VAST,1,N TO (N+6))=Z
$
9160 NEXT N
9170 LET A$(VAST,1,N TO (N+6))="
TOTALS"
9180 CLS : PRINT AT 7,5;"ENTER T
HE NAMES OF:-";"; TAB 5;"U
P TO 99 LINE TITLES"
9190 PRINT AT 13,3;"EACH TITLE I
S LIMITED TO A ";";: PRINT
; TAB 3;"MAXIMUM OF 7 CH
ARACTERS!"

```

```

9200 PRINT AT 18,0;"INPUT S WHEN
YOU HAVE ENTERED ALL THE
LINE TITLES REQUIRED. "
9210 PRINT AT 21,0;"PRESS ENTER
FOR A BLANK TITLE "
9220 LET COUNT=0: FOR M=1 TO 5:
FOR N=1 TO 20: LET COUNT=CO
UNT+1
9225 IF COUNT=100 THEN GOTO 9290
9230 PRINT AT 0,0; INVERSE 1;"EN
TER LINE ";COUNT
9240 GOSUB 9460
9250 IF Z$="S" THEN GOTO 9290
9260 LET A$(M,N,1 TO 7)=Z$
9280 NEXT N: NEXT M
9290 LET A$(M,N,1 TO 7)="TOTALS"
9300 LET PAGES=M: LET W=(20*(M-1
)+N)
9305 IF LINES<21 THEN LET LINES=
LINES+1
9310 IF LINES=21 THEN LET LINES=
20
9320 CLS : PRINT INVERSE 1; AT 1
0,2;"DO YOU WISH TO ENTER C
OLUMN ": PRINT INVERSE 1; A
T 12,10;"MARKERS? Y/N": INP
UT LINE Z$: IF Z$="N" THEN
CLS : GOTO 9350
9330 CLS : PRINT FLASH 1; AT 10,
10;"PLEASE WAIT!": FOR O=1
TO PAGES: FOR N=1 TO LINES:
FOR M=8 TO WIDTH STEP 8: L
ET A$(O,N,M)="" : NEXT M: I
F (O-1)*20+N=W THEN CLS : G
OTO 9350
9340 NEXT N: NEXT O: CLS
9350 LET S$=" "
9360 FOR N=1 TO (WIDTH-8) STEP 8
: LET S$=S$+" ": NEX
T N: LET S$=S$+" ":
9370 LET R=0
9380 LET U$="": FOR N=1 TO 32: L
ET U$=U$+" ": NEXT N
9400 LET R$=" "
9410 FOR N=1 TO (WIDTH-8) STEP 8
: LET R$=R$+"| " : NEX
T N: LET R$=R$+"| "
9420 LET T$=" "
9430 FOR N=1 TO (WIDTH-9): LET T
$=T$+"- " : NEXT N
9440 RETURN
9450 REM : GOSUB
9460 INPUT LINE Z$: IF LEN Z$>7
THEN PRINT FLASH 1; AT 20,0
;"INCORRECT! RE-ENTER!": PA
USE 50: PRINT AT 20,0;"
": GOTO 946
0
9470 RETURN

```


And that, I'm sure you are glad to hear, it the lot.

The only things you really need to know to use the program are:-

The highest number to be entered is 9999999 or 9999.99 in decimal. Totals or sub-totals which exceed this will not be entered and **TOO BIG** will be displayed.

Only enter text comments in columns or lines AFTER calculation.

If program stops for any reason use GOTO 1 to restart - DO NOT use RUN as that will wipe all your data.

The cursor can be moved around with the arrow keys, Symbol-Shift 'A' returns to the menu.

Symbol-Shift ':' prints : at the cursor. Delete deletes at the cursor and back-spaces. Enter moves the cursor to the next column.

Sub-totals at any line may be selected by entering 'T' in the first space of the column where it is required. This needs

to be done every time you require it as the calculate routine removes the T as it goes.

The printer routines and the load/save routines are set up for the PLUS D but are fairly straightforward so you should be able to change them for your system.

OK. It just remains for me to thank J.F.Tydemann for his original ZX Computing article and **FORMAT** for keeping the flag flying.

IT WAS EITHER HIM OR ME!



The HELP PAGE

Edited By:- Ray Bray.

Welcome once more to the Help Page. To start this month we have a query from Kevin Bennett of Watford concerning the use of a Philips 8833 V1 monitor with his Spectrum 128K. He finds that the screen image does not differentiate between normal and bright colours although when the 128K is used with a TV the bright colours are displayed. I understand that the Philips monitor requires a BRIGHT signal to display all the Spectrum colours, and the lack of this could be the cause of your problem. Unfortunately the RGB socket on the 128K does not include a BRIGHT signal, but I seem to remember reading somewhere that on the black 128K (unlike the grey and the 2A), pin 1 of the RGB socket provided a composite video signal which, if connected to the BRIGHT input of the monitor, would produce the necessary result. It is worth a try anyway - let me know how you get on. Kevin also wished to know where he could obtain a lead that is guaranteed to work correctly. I am not sure whether anyone supplies leads specifically for this application.

The next query came in a cryptic FAX to Bob from Michael Williams who wrote: "Help! Do you happen to know a solution to the SORT ABS INVERSE bug in MasterBASIC? It seems to work OK if array size is less than 257 but fails if it is greater than 256!"

This is an interesting bug in that the routine appears to sort the first few entries in descending order, then there is an area which is not sorted followed by

the final 256 entries sorted in the correct ascending order. Perhaps this bug has been sorted out in the latest version of MasterBasic (which I do not have), but if not, the only thing I can suggest is that you sort the array without using ABS and then use a short Basic routine to reverse the entries in the array as follows:-

```
10 FOR N=1 TO ND: REM ND=Total
   entries in array.
20 IF ND<=N THEN EXIT FOR
30 LET T$=A$(N), A$(N)=A$(ND),
   A$(ND)=T$
40 LET ND=ND-1
50 NEXT N
```

Whilst on the subject of sorting, I have received a letter from Ettrick Thomson which was prompted by the reply given to John Hunter in February's issue. Although John's query was not concerned with randomly generated numbers, I thought that the routine which Ettrick sent might be of interest to anyone who has aspirations to scoop the top prize in the National Lottery or is tired of trying to select the correct eight numbers in the Football Pools! Ettrick writes that it is possible to randomly select and output numbers in ascending order without using a SORT routine. The following program (for SAM) will select n numbers from 1 to m, with n=20 and m=100 for illustration:-

```
10 LET n=20, m=100
20 LET p=m+1, q=p
30 FOR r=n TO 1 STEP -1
40 DO: LET p=p-1
50 LOOP UNTIL RND(p-1)<r
60 PRINT q-p;" ";
70 NEXT r
```

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Although the routine is written to run on SAM it could be modified to work on Spectrum by deleting DO: from line 40 and changing line 50 to read:-

```
50 IF RND(P-1)>=R THEN GOTO 40
```

Our next query concerns a subject that hasn't surfaced very often in the Help Pages, the use of the RS232 ports on the Spectrum 128 series of computers to transfer files and data. Steve Brook of Reading has been trying to connect a grey +2 and a black 2b using the RS232 link but without much success at any baud rate. He is using the correct commands to set up the link and the leads are correctly configured but all he can obtain is a transfer of approximately every fourth character from the +2b to the Grey +2 and nothing in the opposite direction. He tried connecting a spare +2 to the 2b but nothing was received in either direction and connecting a +2 to another +2 also produced nothing! No PLUS D or any other extra hardware was attached to any of the computers.

I know that these RS232 links can be difficult to set up properly between different devices but here we have a series of supposedly compatible machines which just refuse to work together. I have a grey +2 and a +2b which have no problem in transmitting and receiving data from each other via the RS232 link. Steve's difficulty is all the more inexplicable because although he obtains some response in one direction with one set of machines, no response is obtained when using a different combination of machines. Having received some garbled data in one direction but none in the other seems to suggest that there is a faulty connection in one of the 'handshaking' lines which, although it might appear to be alright in a continuity test on the lead, the connection between plug and socket might be poor (as happens on the

Spectrum edge connector). However the chances of this happening on a combination of three different computers is extremely unlikely. Nevertheless, the common denominator is the lead itself, therefore the things to look for are:-

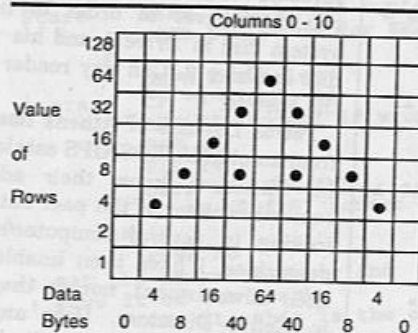
1. Are the pin connections correct; ie the connections are crossed over RXD to TXD and CTS to DTR and all are wired to the correct pins.
2. Check continuity of connection, pin to pin.
3. Check for short circuits between pins.
4. If modified BT telephone plugs have been used, has the correct amount of material been removed from the back of the plugs so that they enter the socket fully and are not too loose?

If all these checks are OK then I am at a loss to know what is wrong. If the clock speed on one computer is wildly wrong then possibly this might be the cause of the problem as the RS232 routine (unlike the tape routine), does not make any timing adjustment based on the incoming signal, however it is most improbable that all four computers would be at fault. If any other reader has experienced this problem and has found a solution please let us know.

Mr A.Ward from Clwyd writes to say that he has the **FORMAT 'Font Library'** and although he is pleased with the results on the monitor screen he would like to be able to print out the various fonts on his printer. He states that he has no problem with printing out the full catalogue of fonts using Specprint but cannot get further than this. What is he doing wrong? The simple answer Mr Ward is nothing, the Font Library is intended as a screen text system only. To change the standard characters used by the printer it is necessary to 'down-load' a new character set to the printer using a special format. The printer handbook

should detail the procedure for this but the following notes might help you understand the principles. I must say at the outset that designing a few characters for down loading is relatively simple, but producing or converting a whole alphabet is tedious work, unless you have a program which is designed for this purpose, even then it is still time consuming.

The easiest way to understand how the download procedures work is to consider firstly how draft characters are handled. For 9-pin printers in the draft mode the characters are based on a 11 X 8 grid, that is 11 columns wide and 8 rows high, and the shape of a character is defined by 11 bytes of data, rather than the 8 used for the screen display. This is illustrated below.



When designing draft characters it should be noted that whilst dots may be placed in adjacent squares in the vertical columns, a space must be left between dots in the horizontal rows, because the print head cannot fire the pins rapidly enough to print adjacent dots horizontally. Other points to note are that normally two columns are left blank (one either side of the grid or two to the right) to provide spaces between characters, and two or more rows at the top and bottom of the grid are usually used for ascenders or descenders.

Descenders are the bottom parts of characters such as p and y, which are printed below the base line.

To obtain the data byte for each column the value of the dots in that column are added, therefore the 11 data bytes for the letter A drawn above are; 0,4,8,16,40,64,16,8,4,0. As you can see this is similar to the way UDGs are designed but the bytes are summed in the opposite direction. In addition to the data bytes the printer also requires one more byte of information to indicate where the character is to be printed relative to the previous one and relative to the base line of the print. This byte is called the attribute byte and it is placed before the 11 data bytes. The attribute byte is divided into three parts:-

1. Bits 0 - 3 These indicate the last column used by the character (1 to 10).
2. Bits 4 - 6 These indicate the first column used by the character (0 - 7).
3. Bit 7 This indicates which 8 of the 9 pins of the print head are to be used. The bit is set to 1 for the top 8 pins, or reset to 0 for the bottom 8 pins.

For fixed-space characters the first and last column bits can be ignored and set to 0, as this information is only required for proportionally spaced characters. Thus for normal use the setting of the attribute byte is either 1 or 0, which indicates respectively that the character is seated on the line (an ascender), or is seated below the line (a descender).

The final piece of information required by the printer is that each letter defined must have an associated code number. For the majority of 9 pin printers it is possible to redefine characters in the code ranges 32 to 126 and 160 to 255, that is a total of 191 characters. It is possible to extend this range by using some of the codes which are not required for control of the printer and the

extended ASCII codes, but I will not go into that now. It should be noted that Epson LX printers can only use the code range 58 to 63.

Enough of the theory, now let us see how it works in practice. The following two-part program defines our download letter A in place of "@" and then prints it. Allow all codes to pass to the printer:-

```
10 CLOSE #3:OPEN #3:"B"
Select draft quality:-
```

```
20 LPRINT CHR$(27);"x";"0";
```

Copy all standard printer characters to download RAM:-

```
30 LPRINT CHR$(27);";";CHR$ 0
;CHR$ 0;CHR$ 0;
```

Define draft download characters:-

```
40 LPRINT CHR$(27);"&";CHR$ 0
;CHR$ 64;CHR$ 64;
```

Download the character:-

```
50 RESTORE 100:FOR N=1 TO 12
60 READ C: LPRINT C;
70 NEXT N
80 STOP
100 DATA 1,0,4,8,16,40,64,40,1
6,8,4,0
```

Now let us test the new character.

Select download character set:-

```
200 LPRINT CHR$(27);"%";"1"
```

Test print:-

```
210 LPRINT "Test character @@@
@@@"
```

Then reset to normal printing:-

```
220 LPRINT CHR$(27);"%";"0"
```

Accept only printable codes:-

```
230 CLOSE #3:OPEN #3:"P": STOP
```

NOTES:-

1. The printer control codes above are Epson compatible codes. All the 0's above are decimal zero.
2. The two last items in line 40 denote the first and last character codes being used in the re-definition. In this case there is only one letter being entered, that for code 64, so this figure is used

for the first and last code.

3. For Spectrum computers with PLUS D, line 10 should be replaced with POKE @ 6,1 and line 230 with POKE @ 6,0.

4. Before switching your printer ON check whether there are any special DIP switch settings required to allow downloading. The printer has to be ON-LINE when you run the program.

Well that is quite enough for this month. If there is space available I will cover NLQ download characters and one or two other general points next month.

ANSWERS WANTED.

W.Holden would like to know if there is any way he can modify the CAMPION spreadsheet program to allow the use of two disc drives in order to hold the system disc in Drive 1 and his working disc in Drive 2. Can any reader provide the answer?

Petros Davakis of Athens has a page from an old MICROSNIPS catalogue and he wishes to know their address. I remember them in the past but, despite looking in several computer/electronic magazines, I have been unable to spot their advertisement, nor do they appear in Kellys Directory. Does any reader know if this firm is still trading and if so what their address is?

That's all we have for this month. Please keep sending your problems/answers to the following addresses:-

Anything SAM or General Purpose:-

Ray Bray (Format Help Page),
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Please remember that if you want any discs/printouts etc. returned then you must include an SAE.

Uni-Dos Corner

By:- Henk van Leeuwen. Edited by:- Adrian Russell.

Once more into the breach dear friends... Another CREATE file for you users of UNI-DOS

With this months CREATE file it is possible to ERASE CREATES which are already in memory. It is necessary to load this CREATE first because it will erase backwards.

The syntax is ERASE @.

```
ORG 60000
;ERASE @
Start DEFB 1 ;only one syntax
DEFB 210 ;code for ERAS

E DEFW Erase_len
CP "@" ;code 64
RET NZ ;reject if wrong
RST 40
RST 24
DEFB 13 ;SYN.END
LD HL,(23635) ;start of
Basic
PUSH HL
; get the start of Basic and
; save it on the stack
DEC HL ;this is the cha
racter value
DEC HL ;see below
DEC HL
; length byte from the CREATE
LD A,(HL)
; low byte in C from length
LD C,A
INC HL
LD A,(HL)
LD B,A
; high byte in B from length
INC BC
; find total length
INC BC
INC BC
POP HL
; start Basic program from stack
SBC HL,BC
; find new start address
```

```
RST 16
DEFW 6632
; call the clear space routine
; at 6632 (#19E8) in main ROM.
RST 24
DEFB 14 ;COM.END
Erase_len EQU $-L_erase
```

And again the DATA statements for a Basic poker program if you really need them.

```
350 DATA 1,210,29,0,254,64,192,
239
351 DATA 223,13,42,83,92,229,43
,43
352 DATA 43,126,79,35,126,71,3,
3
353 DATA 3,225,237,66,215,232,2
5,223
354 DATA 14
```

When finished typing this program save it as:-

```
SAVE d*"USR_code"USR 60000,33
```

Now, lets do roughly the same thing, but in a different way. The advantage with this program is that it gets rid of all CREATES in memory. This program is an EXECUTE file rather than a CREATE as we have seen so far in UNI-DOS Corner.

EXECUTE files are loaded and executed, they are not extensions to Basic. Once used it would need to be loaded again if you want to use it a second time. See the UNI-DOS manual for more details.

OK, here is the source for the routine:-

```
ORG 60000
LD HL,(23635)
;Address of start of Basic
LD DE,23755
```

```
;new Basic address
AND A
SBC HL,DE
LD B,H
LD C,L
;length from CREATES
LD HL,23755
RST 16
DEFW 6632
;clear and reclaim space
RET
```

And again the DATA statements.

```
600 DATA 42,83,92,17,203,92,167
,237
601 DATA 82,68,77,33,203,92,215
,232
602 DATA 25,201
```

When you have finished typing the program save it as:-

```
SAVE d*"ERASE_CR " X,60000
```

The 60000 address is only the one that the routine is saved from, it is not the one that the routine is loaded into when you use it.

Right, that is all for this time, thanks for reading.

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BASICally Mousing...

Or Better Ways To Use A SAM Mouse In Basic

By:- David Finch.

One area that has not been covered before in **FORMAT** is how to use the SAM Mouse within your own programs.

I have also used my mouse lots in various programs - including some of my own creations. I am about to show you how easy it is to do so...

Beginners following my **BASICally Speaking** series may like to read and learn from this article, but don't worry if you get confused. Specy owners, sorry but this is SAM mouse only.

The program will move a pointer about the screen and return to your program when a button is pressed, telling you exactly when on the screen the pointer was, and which button was used. So first we need a pointer.

```
10 DEF PROC drawarrow
20 DRAW 8,0
30 DRAW -2,-2
40 DRAW 3,-3
50 DRAW -4,-4
60 DRAW -3,3
70 DRAW -2,-2
80 DRAW 0,8
90 END PROC
```

Type:- **PLOT 128,97: drawarrow**

to see the arrow.

My first thought was to GRAB this, along with a mask, and save it to disc to load when the program runs. (Beginners, don't worry about this, it will become clear in a few months time). However, there is no point since you have the program to create it in Basic. If you wish, you could design a complicated pointer in FLASH!, and you would have to save it

to disc.

You can't do anything in Basic with the mouse until you have loaded the mouse driver code from the disc you got in your mouse package. It is called "mdriver" and needs to be on any disc that you may use these procedures on. (It has nothing to do with Revelation's DRIVER software).

COPY "mdriver" to "*" will copy it from your mouse disc to any other. However, I found the SAMDOS won't do this (MasterDOS will), you need to LOAD "mdriver" CODE, then save it! Why?

The next procedure, called SetUpMouse will load the driver in, draw the arrow and its mask, and grab them. For tidiness, I have hidden this drawing in SCREEN 2, so that it is not seen.

Opening screens makes them available in memory, closing makes them unavailable again. Note that I have CLOSED screen 2 before I open it because if the program was 'ESCaped from' while the procedure was running, the next time it is run will give the SCREEN ALREADY OPEN message. I have also closed it after the sprites are grabbed for tidiness. You can CLOSE a closed screen (stays closed), but you can't OPEN an open screen.

Also, I want to place the whole program above line 64000 so that it can be merged into any other program.

RENUM 10 TO LINE 64160

This command places the program so far in the correct place.

Now type in the following:-

```
64000 DEF PROC SetUpMouse
64010 LOAD "mdriver" CODE
64020 SCREEN 1
64030 CLOSE SCREEN 2: OPEN SCREE
N 2,4: DISPLAY 1: SCREEN 2
64040 PAPER 0: PEN 15: CLS
64050 DIM arrow$(3,53)
64060 LET yos=-18
64070 PLOT 0,191
64080 drawarrow
64090 PLOT 12,191
64100 drawarrow
64110 FILL 13,190
64120 GRAB arrow$(1),0,191,10,10
64130 GRAB arrow$(2),12,191,10,1
0
64140 SCREEN 1: CLOSE SCREEN 2
64150 END PROC
```

This procedure need only be run once at the start of any program that uses the mouse procedure, which is the procedure that you are about to type in.

It is based on two loops, one inside the other. The inner loop finds out the position of the mouse and whether a button has been pressed. If nothing has changed then it keeps looping. This prevents the arrow from flickering.

The outer loop GRABs the background and places the arrow sprite on the screen. When the mouse is moved or pressed it replaces the background and loops if there wasn't a button press (when it loops it redraws the arrow). When a button has been pressed it makes x be the x co-ordinate of the pointer position, and y the y co-ordinate. The variable btn is 1 if the left button was pressed, 3 for the right, 4 for both.

A nice feature is that, when you call the procedure again, the pointer will be where you left it. If you want it elsewhere, simply change msx and msy.

So type it in...

```
64250 DEF PROC mouse
64260 DEFAULT msx=128,msy=96
64270 DPOKE 23446,msx
64280 DPOKE 23448,msy
```

```
64290 DO
64300 GRAB arrow$(3),msx,msy,10,
10
64310 PUT msx,msy,arrow$(1),arro
w$(2)
64320 DO
64330 LET newx=XMOUSE,newy=YMOUS
E
64340 LET btn=(1 AND BUTTON 1)+(
3 AND BUTTON 3)
64350 LOOP UNTIL (NOT (msx=newx
AND msy=newy) OR btn)
64360 PUT msx,msy,arrow$(3)
64370 LET msx=newx,msy=newy
64380 LOOP UNTIL btn
64390 LET x=msx,y=msy
64400 END PROC
```

You may like to save all this to disc!

To show you how easy it is to use these procedures, here is a program that draws on screen. Press the left button to plot a point, the right button draws a line from the last point plotted, and both buttons together clear the screen.

```
10 SetUpMouse
20 DO
30 mouse
40 IF btn=1 THEN PLOT x,y
50 IF btn=3 THEN DRAW TO x,y
60 IF btn=4 THEN CLS
70 LOOP
```

If you were programming these seven lines from scratch you would merge your mouse procedures into this program. You must ensure that a disc containing the mouse driver is in the drive.

You can design icons in FLASH!, GRAB them and PUT them in your programs, and use this to point and click on them. EASY!



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DEF PROCing

By:- Darren Talbot.

We all know that DEF PROC and END PROC stand for DEFINE PROCEDURE and END PROCEDURE, but what Sam's manual does not make clear is that the commands are much more than a posh GOSUB. As far as I know, what I have to say here will also apply to Spectrum users running BETA Basic.

Typing a procedure name makes it execute, but did you know that you can also include parameters which will affect the way that the procedure executes? This feature makes it possible to add simple commands almost as extensions to basic.

EXAMPLE 1

```
10 DEF PROC SLINE A,B,C,D
20 PLOT A,B : DRAW TO C,D
30 END PROC
```

This very simple example emulates a draw from A,B to C,D command and is executed by typing the procedure name then its parameters. Any variables used as parameters are local, ie if the variable 'A' contains information when the procedure is called then this information is restored after the procedure has ended. If a procedure is defined with parameters then not supplying those parameters when calling the procedure will result in a VARIABLE NOT FOUND error. This can be avoided by supplying default variables. Add the line:-

```
15 DEFAULT A=0,B=A,C=255,D=173
```

to the above example and just typing SLINE will draw a line from the bottom left of the screen to the top right.

EXAMPLE 2

```
10 DEF PROC CIRC X,Y,C,R,F
20 CIRCLE PEN C,X,Y,R
30 IF F=1 THEN FILL PEN C,X,Y
40 END PROC
```

This example is used to draw coloured, filled circles on the screen. Parameters X and Y are the screen co-ordinates of the centre of the circle, C is the colour, R is the radius of the circle and if F=1 then the circle is FILLED in the selected colour.

eg. Typing CIRC 128,88,6,50,1 will draw a yellow filled circle in the centre of the screen.

EXAMPLE 3

```
10 DEF PROC OVAL M,N,A,X,Y,P
20 LOCAL C,S,T,Q,W
30 DEFAULT M=50,N=10,X=128,Y=
  88,A=0,P=20
40 LET A=A/180 * PI: LET C=CO
  S A,S=SIN A
50 PLOT X+M*C,Y+M*S
60 FOR T=0 TO 2*PI STEP 2*PI/
  P
70 LET Q=COS T,W=SIN T
80 DRAW TO X+M*C*Q-N*S*W,Y+M*
  S*Q+N*C*W
90 NEXT T
100 DRAW TO X+M*C,Y+M*S
110 END PROC
```

This program will draw an ellipse with specific dimensions. M is the length of the ellipse, N is the height, a is the axis by which to rotate the ellipse, X and Y are the screen co-ordinates and P is the 'accuracy' parameter.

The addition of the following line to the above routine helps to illustrate the function of the procedure, just type it in

and then RUN to see what happens.

```
5 FOR I=10 TO 180 STEP 10:OV
  AL 70,20,I,128,88,20:NEXT
  I
```

The procedure works by drawing shapes with P number of sides so the higher parameter P is, the more accurate the oval will be.

ADDITIONAL EXAMPLES

```
10 DEF PROC BOX A,B,C,D
20 DEFAULT A=0,B=A,C=255,D=17
30 PLOT A,B,: DRAW TO A,D: DR
  AW TO C,D
40 DRAW TO C,B: DRAW TO A,B
50 END PROC
```

This will draw a box on the screen with A,B as the bottom left corner and C,D as the top right. Default is a box the size of the whole screen.

```
10 DEF PROC DEC A
20 LET A=A/100:LET DEC$=STR$
  A
30 IF INSTR(DEF$,".")=0 THEN
  LET DEC$="."
40 IF INSTR(DEC$,".")=LENDEC$
  -1 THEN LET DEC$=DEC$+"0"
50 END PROC
```

This will take a number and turn it into a string in the format of pounds and pence. eg DEC 456:PRINT DEC\$ will produce 4.56 (you could add the £ sign within the procedure if you wanted).

Oh, one last thing before I finish. Remember that, as far as the program is concerned, the line between DEF PROC and the END PROC do not exist - unless you call the procedure. If you look back to the test I gave you for example 3 you will see that there was no need for a STOP statement after line 5, SAM just skips over the defined procedure. However, there can sometimes be problems with this if there is more than one END PROC, so it is always wise to add a STOP statement to be on the safe side.

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E-TRACKER

FILE VIEWER

By:- James Gasson.

This article sets out to provide E-Tracker users with a Viewer Program to use on Modules like those so often featured on FRED discs. But first, a few words on SAM's memory paging.

SAM's internal RAM memory is divided into 32 pages each of 16Kb, that is each page is 16384 bytes long. They are numbered 0 to 31 (on a 256Kb SAM, pages 16 to 31 are missing). To access the RAM from Basic, all the bytes in all the pages are numbered sequentially from 16384 (ie the first byte of the first page is numbered 16384, the second byte is 16385, the first byte of the second page is numbered 32768 etc.). Addresses 0 to 16383 are for the ROM and contain permanent data - Basic, tape routines etc. (there are actually 2 ROM pages, but the other one is hidden from Basic).

The addresses 20736 to 20768 are called the page allocation table, and record what each page contains. There is one byte for each of the 32 RAM pages plus an extra byte to mark the end. (on a 256Kb SAM, the second half of the 32 bytes contain the number 255 which tells SAM these pages don't exist). Some values are:-

- 0 - unused
- 32 - utilities
- 48 - Master Basic
- 64 - SAM Basic
- 96 - DOS
- 192 - Screen
- 224 - Driver
- 237 - Driver
- 225 - non-existent

And now a plea for the Save SAM's Page Allocation Table Protocol Foundation (SSPATPF): Please (please), if you write a program that uses extra memory pages, follow the protocol. All the routines you need are in my program 'E-Tracker Module Viewer' lines 100..180 allocate pages while lines 800..810 unallocate pages. All you need to change is the 'FOR byte=0 TO 4' in each routine to 'FOR byte=0 TO one_less_than_the_number_of_pages_you_want', and put the routines in the right place in your program, it's that simple. The first page number is held in 'page' and the corresponding address held in 'address'.

E-TRACKER MODULE LAYOUT

An E-Tracker module is 78626 bytes long and requires 5 pages, it doesn't matter where it is loaded into memory for displaying from Basic, because E-Tracker puts the module in the right place when it is being used from E-Tracker. The filename is important though, if changed from Basic, it must remain 10 characters long (or padded up to 10 characters with spaces), and the last 2 characters must be a full-stop, then a capital 'M'. The start address for a module is usually 50000, but because it is more convenient to load it elsewhere in memory, I won't use the address to explain how a module is set out, but the offset from the start of the file. (ie the first byte is offset 0). I shall describe the sections of the file by giving the offset, the number of bytes, and a description of

West Coast Computers

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W1012	SAM Coupé Special Pack. 256K with external disc/printer interface. A special limited offer, ideal for anyone upgrading from PLUS D as you can use your existing disc drive. Because these machines have been in storage for some time there may be some slight marks on casing but all are fully tested and guaranteed.	£109.95 Only a few left
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W1121	SAM Coupé Disc Upgrade Kit - all you need to upgrade to a twin drive machine. Needs good soldering skills to fit. You also need de-soldering tool to remove one of the connectors on the main SAM board. Comes complete with all instructions, components and a top quality 3 1/2" drive mechanism.	£64.95
W1122	SAM Coupé Disc Upgrade Kit - as above but without drive mechanism.	£29.95
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W1103	RS232/Parallel Interface (COMMS). (for Coupé)	£34.95
W1104	1 MegaByte External Memory Pack. (Needs MasterDOS to run from Basic).	PHONE
W1106	SAM Mouse System. Interface, Mouse and Software. Plugs into mouse port on rear of SAM. More and more software now works better if you use a mouse.	£39.95
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W1108	Internal 256K Upgrade (for older SAMs with only 256K of memory)	£34.95
W1109	TWO ^{LP} allows 2 interfaces to be connected to SAM expansion port at same time.	£19.95

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YOUR LETTERS

Dear Editor,

I've come to realise over the years that computing is a joke - on me! I am not only computer illiterate but I am a computer idiot too. It always takes forever to understand anything or get it to work, and because I can only get to the computer at irregular intervals, I usually have to start all over again because I have forgotten what I did last time or what I have to do now.

Take John Redfern's article on Video Titling in the February issue of **FORMAT**.

I have just been talking to an electronic chap who has designed an interface to produce PC screens on TV. It will be incorporated into a TV set and will be sold for between £700 and £900. Yet here is a PC/TV format free but I can't get it to work! I tried it and soldered the leads on my SAM scart cable just as he said, but all I could get on my Video TV screen was a scrolling mass of colours.

When my SAM first arrived years ago I had an old Thompson monitor which takes separate video and audio connections via RCA phono plugs. I tried to get a proper lead but ended up having to take the scart plug apart and solder the inner lead to pins 1 & 2 and the screen to 4.

So, since John's system wouldn't work, I just tried connecting this monitor lead to the video and got a beautiful picture of SAM's start up screen which I immediately recorded on video.

Long before the SAM, I had made my own monitor lead (same monitor) on my

Spectrum +. So I tried that too and got a perfect picture. Makes the PC look silly doesn't it?

But I am really annoyed. How could I not know that the monitor lead would also work with a video player? I could have been using it years ago.

So what is the basic difference between a TV signal, a monitor signal and a video signal and why is it so difficult to make them compatible? It would save everyone a lot of trouble if they were all the same.

I would like to pay the subscription for Chris Ingram in Malawi. Even if he doesn't think **FORMAT** is so useful to him now, perhaps he may change his mind! Don't tell him who paid it, just an admirer.

Yours Sincerely, Anon.

Now that is what I call a nice gesture, paying someone else's subscription. It was very heart-warming when your letter arrived, and don't worry, your identity is safe with us. *Ed.*

Dear Editor,

Thank you for the return of my SAM Coupé with both disc drives fitted. I am most impressed with the rapidity of the whole operation. Would you please warn your readers to beware of discs that have been through the post and to check that the slide returns freely before committing it into the disc drive. The disc that ruined the drive had a severe dent on the underside of the slide which was not obvious from the top. If it does jam inside take the drive apart before you try and drag the disc out and wreck the head. The sender says that it was me

"that put the disc in the disc drive". Can you run a competition for readers to suggest alternative things to do with a disc besides put in a disc drive?

I noticed a letter from Mr D. Smith in **FORMAT** for March about chess. I ported various chess programs for the speccy to the SAM with the original emulator and the Messenger. I am in the process of writing a data base for storing and playing through chess games on the SAM with options to try other variations and include opening and end game theory as opposed to the multitude of chess playing program. I am interested in contacting other chess players with SAMs. Are there many of us?

Yours Sincerely, G.S.Hathorn.

To explain to readers, Mr Hathorn received a disc through the post which got stuck in his drive because the metal flap was bent outwards from the disc body. This led to the heads on his drive being damaged beyond repair (there ain't much that can be done to heads anyway). So, the moral is check the disc first. And if it does get stuck, call us for help BEFORE you damage the drive mechanism. **Ed.**

Dear Editor,

This is just a quick note to ask you not to slag people off in your magazine. In your reply to Mark Sturdy's letter you implied that he was stupid because of his spelling and hand writing.

If he prefers to spell the word 'disc' with a 'k' instead of a 'c' this doesn't mean you have to take the mick out of him!

Yours Sincerely, Ray Johnson.

Oooo...

Dear Editor,

For Mr Morris (see last month's Your Letters) and anyone else who is interested a company called CLP (telephone 01258 459544) which sells A5

continuous listing, 1000 sheets (70 GSM) for £13.95 (inc VAT). They also have 'continuous' compliment slips at £23.95 for 1000.

Yours Sincerely, Carol Brooksbank.

Dear Editor,

After reading the Video Titling article by John Redfern in February (Vol.8 N°6) issue of **FORMAT**, I tried this on my Spectrum+2 (Grey case) and my +2b (Black case) without success, with both computers I get broken pictures or coloured bands across the screen with the computer signal output in the background. Having tried to re-tune the TV and Video I still get the same results. Are there any of your readers out there that might be able to help, or tell me if there is any fault on my computers. All aspects of the computers work without any other problems.

Yours Sincerely, B.H.Davis.

Dear Editor,

Just received my renewal form with my latest issue of **FORMAT**, my doesn't time fly. Is it 5 years since I first placed my very first order with you, at that time I had just bought the brand new SAM Coupe along with a disc drive which I had to fit myself and then wait two months for a system disc which I loaded up and had to call by using CALL 229385, as I had just the basic 256K job. Prior to that I had, and still have got the demo tape, which had the first Flash program on, it took almost 30 minutes to load but was still amazed at what could be achieved using Basic.

Thinking back, a lot of water has gone under the bridge since MGT went to the wall, then there was the SAMCO saga I missed by two day's. Getting my SAM back from repair after it was damaged when lightning struck a house near by while I was using it (my ears are still ringing). I had picked it up from the Post

Office and found that the six Newdisc's I had ordered were missing, getting on the phone to Swansea I heard the fateful recorded message that Samco had ceased trading and were in the hands of the receivers. Since then with a lot of help from dedicated SAM users we seem to have overcome what I prefer to call teething troubles.

So please find enclosed a cheque for another twelve months supply of your excellent magazine, no doubt I will see you all at the Gloucester Show at the end of April. If there is anyone interested in a lift to the show I have a spare seat in a Ford Escort van. I just hope the return journey is not as bad as last time, it took me just over two and a quarter hours to get there and a horrendous 6 hours return due to road works and two separate accidents.

PS. I could try and write an article for the mag about how I came into computing.

Yours Sincerely, Stuart Sullivan.

Look forward to your article Stuart, and thanks for your kind offer of space on the trip to the show. Stuart gives his address as 19, Polefield Circle, Prestwich, Gt. Manchester, M25 2NP. Sorry but he did not give a phone number. **Ed.**

Dear Editor,

Is the new DX1 disc interface ordered in August 94 still available, if it is I would like to change the order slightly. Instead of one for a +2A I would prefer it for a 128K Spectrum with the idea in mind of trying a Fixer Kit for the +2A.

I have a Spectrum +, Spectrum +128K and for some reason a +2A (can't resist car boot sales) I am toying with the idea of setting up a network between the Spectrums but as usual I can't get started for lack of information. I am hoping you can help if only by pointing me in the right direction. Just one more moment of your time, do you have a User

Guide Handbook for the Spectrum 128K for sale.

Yours Sincerely, Alan Davies.

As we have explained before, the DX1 is on hold at the moment because of the problems with Mark Hall at Blue Alpha. Hopefully it will see the light of day soon, but keep a eye on **FORMAT** for news.

The original 128K handbook was not worth having, all colour and gloss and nothing in it. A +2 manual covers just about everything for the older 128K and we sometimes have a few available at shows, if you are coming down to the next Gloucester show then give me a ring and I will try to make sure there is one there for you Alan. **Ed.**

Dear Editor,

I'd like to thank you for the speed and efficiency with which you replaced my drive, and for the hand delivery, What service!

It was good to meet you and I hope that you enjoyed your evening with Sir Clive. I trust that we'll get a report on the event in the next issue of **FORMAT**.

Yours Sincerely, John McCabe.

Personal deliveries only made if they save me money, but it was nice to meet you John. And yes, I will try to do a write-up on Sir Clive as soon as I can. **Ed.**

Dear Editor,

The reason I am writing to you is that two months ago I sent a subscription form to INDUG Subscriptions, but until now I haven't received anything.

I had to write to you, because I haven't got the address of INDUG Subscriptions anymore. Perhaps they never received my subscription form.

I am wondering if you could help me out or give me the address of INDUG, so I could write to them.

Yours Sincerely, Martyn Groen.

Yes Martyn, your subscription form did arrive and this should be the second issue of **FORMAT** you have received. Your letter must have crossed in the post with the March issue.

However, I will use this opportunity to clear up the confusion that some people seem to have over **INDUG** and **FORMAT**.

INDUG is the user group that started it all, way back in 1987 (when I had far less grey hairs and no beard). **FORMAT** was the newsletter for **INDUG** members. When things got bigger I formed Format Publications (so I could do other things as well) but you subscribe to **INDUG** and **FORMAT** comes free with that membership. Your **INDUG** membership also earns you discounts from many of the advertisers in **FORMAT**.

I hope that is now a little clearer. *Ed.*

Dear Editor,

In reply to the questions on the renewal form you sent me. All the articles in **FORMAT** are generally of very high standard, and I read it all, including adverts. A professional-looking and attractive magazine. Long may you keep the standard up!

Perhaps one tiny niggle though this month - an article by Andrew Gates on Z80 machines that doesn't even mention the greatest - the Einstein! (Oh all right - the SAM's good too). And Forth, peculiar???

Here speaks an addict on a hobby-horse; I have four Einsteins, (and also one SAM Coupé). Einsteins are easy-to-program, under-rated, lovely computers with built-in disc drives, and I program them all the time in Forth. I mention it because I am hoping to transfer some finished programs to the SAM eventually. It shouldn't be too difficult to transfer a Forth kernel to SAM. All I would then have to do is to re-define the special graphic words and slow things down a bit, as I believe

SAM's Z80B chip runs at twice the rate of Einy's Z80A. I love Forth because it runs eight to ten times faster than Basic, takes half the time to write a program, is much easier than machine code and lets you do anything - even rewrite (and shorten) the language. There are none of Basic's restrictions on commands or machine access at any level.

Among other Forth programs, I would love to do a version of Driver one day that shows file-lengths automatically in windows (so much more important than dates, if you are trying to fit one more file on to a disc), and which shows an icon automatically for every file it finds on disc. You shouldn't have to supply one especially to see it for each file, (thought you could change the standard icon designs for individual files if wanted).

Well, that's answered everything and aired my hobbyhorse. Oops - one more question. What would you most like to see covered in a future issue?

How about Forth programming on SAM.

Yours Sincerely, Norma Wrangham.

Ahh, the Einstein, yes Norma, it was a very good machine. Mine is still giving good service in a local school I believe. There is an Einstein users group still running, if you are not already in contact their address is c/o Tony Adams, Ivy Cottage, Church Road, New Romney, Kent, TN28 8TY.

As to Forth on SAM. If you need any help in getting it going then give me a ring. With 'C' on its way it would be nice to offer Forth to SAM users as well. *Ed.*

Dear Editor,

Thank you once again for another years **FORMAT**. I must congratulate you on the contents, and thank all the contributors for their excellence in subject matter.

I have just completed an index of all the volumes that you have produced. It has taken two attempts, and I find that

it actually requires two indexes. One is for each volume and contains every detail of the contents, news items and editorials. The second is limited to the articles that apply to programming, reviews, and such like - items that one needs to refer back to as and when needed. To do this I have used an index program from **FORMAT**, which is constantly modified, for the volume only Index. But for the combined index I have found that the Hilton Computer Service's *Personal Filing System* had the capacity to take the required number of entries, alterations and additions being added to the original entry.

As the result of this I discovered that I was at a loss to find out where certain items of software could be found as the suppliers names were hidden amongst the articles and were not easily found. This has lead to the last item in what I would like to see in future issues. Perhaps an annual supplement giving a list of SAM & Spectrums suppliers mentioned in the previous year's **FORMAT** would be a good customer and client service.

Yours Sincerely, John Thornborrow.

Dear Editor,

Congratulations to Ken Elston, his Easter Day calculator on P31 of the March **FORMAT** works perfectly for the years I have data to hand, namely 1994,5,6. The MOD simulation was very useful for the Spectrum but one also needs to simulate IF...THEN...ELSE by putting:

```
120 IF r<11 THEN PRINT " March
      "; r+21 : GOTO 130
125 PRINT " April "; r-10
```

Here is the complete listing:-

```
1 REM Vol.8 No7. Format.March
  1995. p31. Easter Day by K
    .Elston.
2 REM Revised to ZX Spectrum+
  128K by B.C.R.Burford 1103
```

95.

```
10 PRINT "Easter Sunday Calcul
    ator"
20 INPUT "Year? ";y: PRINT "Ye
    ar=";y;";
30 LET i=INT (y/d100)-INT (y/4
    00)
40 LET a=y-INT (y/4)*4
50 LET b=y-INT (y/7)*7
60 LET c=y-INT (y/10)*19
70 LET d=(19*c+15+i-INT (y/300
    ))-INT ((19*c+15+i-INT (y/3
    00))/30)*30
80 LET e=(2*a+4*b+6*d+4+i)-INT
    ((2*a+4*b+6*d+4+i)/7)*7
90 IF d=29 AND e=6 THEN LET e=
    -1
100 IF d=28 AND e=6 AND c>10 TH
    EN LET e=-1
110 LET r=d+e+1
120 IF r<11 THEN PRINT "March "
    ;r+21: GOTO 130
125 PRINT "April ";r-10
130 PRINT : GOTO 20.
```

Yours Sincerely, Roy Burford.

Many thanks Roy, a good job of conversion there. *Ed.*

Dear Editor,

I am renewing, although because the mag is now so SAM orientated I do not find a great deal to interest me. I would hope, although I fully understand your difficulties, that more Spectrum based items would appear. I am aware that SAM programs can be adapted to work on a Spectrum in some cases but would welcome it if when short SAM programs are published it might be possible to suggest how these could be altered. My computer set up is fully Spectrum and QL based so I do not see the need to get a SAM as what I have is sophisticated enough to meet all my needs.

With the extra month added to the sub I assume that this sub will run out with the May issue 1996.

Yours Sincerely, John Bourne.

Keep reading John, there are still

plenty of Spectrum items in **FORMAT** and I'm always looking for more. *Ed.*

Dear Editor,

I have just received the March 1995 issue, along with it came a printer interface. From the previous issue I received the printer interface which I ordered. So this new one was un-ordered so hence, I am returning it. I like being honest, though I thought if you are giving away printer interfaces, then what about extra issues (*JOKING*).

On to another matter, at the top left of this page you will see a '1', this letter is done on *The Secretary*, I need to know how I can switch this off???

PS. I enclose my renewal form in the hope that **FORMAT** will live long and prosper.

Yours Sincerely, Alan R. Tilley.

Jenny has now got a very sore wrist, having written out 1000 times "I must not send someone something they have already been sent". The fine of three weeks wages has also not gone down too well with her.

Anyway, I thought we had solved the phantom '1' problem in past issues of **FORMAT**. Do you have the latest version of *The Secretary*? *Ed.*

Dear Editor,

I hope you can help me. I have a problem with my SAM Coupé. The sound has stopped on games and they have lost their life without the sound. When I type ZAP, POW etc in BASIC, I still hear the sounds, and of course, on Spectrum Games. I had a similar problem when I first bought my SAM from Blue Alpha in the Summer of 1993. They repaired it and said on the report that the sound chip data lines were inactive. Do you think this could be my problem once again? Do you know how much it would cost to get it fixed if that was the case? Everything else on the computer is fine.

I can't bear to be without the computer

because I use it everyday and use it for programming and everything else I can think of, so if I sent it to you, how long would it take to get back to me?

You mentioned in **FORMAT** Vol.8 N°5 (Jan 95) about the hard disc, is this just the interface or the interface and the hard disc drive?

Please print my letter in **FORMAT** because I've never had one printed in my life!

Yours Sincerely, Darren Wileman.

It does sound like the Philips sound chip. The BEEP and the ZAP/POW/BOOM commands do not use the sound chip, where as music in games does. The biggest delay in getting a sam repaired these days is the time Royal Mail Parcel Force take to get machines to us. The advertised 3 day service takes over a week in some cases. Once a machine is here we try to get it fixed by the experts and back out the door within 3 or 4 days - we just don't have the room to store things so they have to move quick. We now use AMTRAK for overnight delivery to most parts of the country so return is now quite swift, once we have the machine in the first place.

May I suggest, if you (or anyone else for that matter) want to be parted from your machine for the shortest period of time, that you drop it into us at the April show. That way you will know it arrives safe and it should be back to you by the end of the following week. Just make sure you clearly label the box, and if possible put a sticker on the underside of the machine. More news on the hard disc very soon I hope. *Ed.*

Letters may be shortened or edited to fit on these pages although we try to edit as little as possible.

This is YOUR letters page so it is up to you to fill it with interesting things. Come on, get writing, any subject even remotely related to computers. Just keep things as short as you can so we can fit in as many as possible each month. Please write clearly or type your letters. Send them to the address on page 3 or fax them to us on 0452 380990.

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